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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/941,371	08/28/2001	Mark Kintis	12-1201	6016

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EXAMINER	
FILE, ERIN M	

ART UNIT	PAPER NUMBER
2611	

DATE MAILED: 08/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/941,371	KINTIS, MARK	
	Examiner	Art Unit	
	Erin M. File	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 June 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6,12-15 and 28-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,12-15 and 28-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 August 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1-6, 12-15, 28-32 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1 and 28 are rejected under U.S.C. 103(a) as being unpatentable over Thorson (U.S. Patent No. 6,101,225) in view of Horiguchi et al (U.S. Patent No. 6,133,791) and Spruit et al. (U.S. Patent No. 6,549,495).

Claims 1, 28, Thorson discloses a first mixer stage (fig. 2) including a mixer (fig. 2, 122, col. 5, lines 32-34) with first (fig. 2, 133, col. 5, lines 33-34) and second (fig. 2, 221, col. 6, lines 34) input ports and a first output port (fig. 2, 117, col. 6, lines 35), a second mixer stage which including a second mixer (fig. 2, 120, col. 5, lines 25-26) with third

(fig. 2, 131, col. 6, line 20) and forth (fig. 2, 219, col. 6, line 23) input ports and a second output port (fig. 2, 115, col. 5, line 29) with first input port (fig. 2, 133, col. 5, line 33) electrically coupled to third input port (fig. 2, 131, col. 6, line 20), a phase modulator (fig. 2, 242, col. 6, line 7) for phase modulating a first local oscillator signal (fig. 2, 113, col. 5, line 38) electrically coupled to first input port (fig. 2, 133), and an inverse phase modulator (fig. 2, 240) for inverse phase modulating a second local oscillator signal (fig. 2, 111) electrically coupled to third input port.

Thorson does not specifically disclose modulating according to a pseudorandom number (PN) code. Horiguchi teaches a pseudorandom number (PN) code generator (fig 14, 51) controlling a phase modulators (47) that outputs a mixer. The use of a PN code to synchronize BPSK modulators is well known in the art and would be obvious at the time of invention to incorporate PN code controller such as Horiguchi's into Thorson's mixing device (col. 4, lines 10-18).

Although neither Thorson nor Horiguchi discloses an inverse phase modulator which uses the same code as the modulator, Spruit discloses modulation and inverse modulation which use the same code. Further Spruit discloses this method has the advantage that the detection signal of the code track is stronger (col. 2, line 65 - col. 3, line 2). Because of this advantage, it would have been obvious to one skilled in the art at the time of invention to include the invention of Spruit into the combined invention of Thorson and Horiguchi.

4. Claims 2-5, 12, 13, 14, 29, 30 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thorson (U.S. Patent No. 6,101,225) in view of Horiguchi et al (U.S. Patent No. 6,133,791) and Spruit et al. (U.S. Patent No. 6,549,495) as applied to claims 1 and 28 above, and further in view of Underbrink et al. (U.S. Patent No. 6,754,287).

Claim 2, Neither Thorson, nor Horiguchi, nor Spruit specifically disclose a phase shift keying (PSK) modulator. However, a BPSK modulation is a very general type of phase modulation in which digital information is modulated by changes in phase angle. In his apparatus for producing a modulated signal Underbrink discloses the use of PSK modulation in his digital modulation technique (col. 4, lines 5-10). Because of the prevalence of digital data in communications systems, and common use of phase shift keying in the art (col. 4, lines 9-10) it would have been obvious to one skilled in the art to use PSK modulator for a Phase Modulator at the time of invention.

Claims 3, 13, Neither Thorson, nor Horiguchi, nor Spruit disclose a binary phase shift keying modulator, however, BPSK is a common type of phase modulation. In his digital modulation technique Underbrink discloses the use of BPSK modulation as a type of PSK modulation in which two carrier phases are used (col 7, lines 45-63). BPSK modulation is commonly used because of its simplicity and high tolerance to noise. It would be obvious to one skilled in the art to use BPSK modulation and inverse modulation for a Phase Modulation and inverse Modulation at the time of invention.

Claim 4, Neither Thorson, nor Horiguchi, nor Spruit disclose a binary phase shift keying (BPSK) modulator modulated according to a pseudorandom number (PN) code.

Horiguchi teaches a pseudorandom number (PN) code generator (fig 14, 51) controlling a phase modulators (47) that outputs a mixer. Underbrink further discloses the generation of a BPSK signal for modulation purposes (col. 7, lines 62-65). The PN code has the advantage of providing synchronization to modulators, such as BPSK modulators, and would therefore have been obvious at the time of invention to incorporate PN code controller such as Horiguchi's into Thorson's mixing device.

Claim 5, Neither Thorson, nor Horiguchi, nor Spruit disclose a binary phase shift keying inverse modulator, However, BPSK is a common type of phase modulation. In his digital modulation technique Underbrink discloses the use of BPSK modulation as a type of PSK modulation in which two carrier phases are used (col 7, lines 45-63). BPSK modulation is commonly used because of its simplicity and high tolerance to noise. It would be obvious to one skilled in the art to use BPSK modulation and inverse modulation for a Phase Modulation and inverse Modulation at the time of invention.

Claims 12, 30, Neither Thorson, nor Horiguchi, nor Spruit disclose a quaternary phase shift keying (QPSK) modulator. A QPSK modulator is a common type of PSK modulator. In his digital modulation technique Underbrink discloses the use of QPSK modulation as a type of PSK modulation in which four carrier phases are used (col 7, lines 65-68).

Claims 14, 32, Neither Thorson, nor Horiguchi, nor Spruit specifically disclose an M-ary modulator and inverse M-ary modulator. In his digital modulation technique Underbrink discloses the use of M-ary, or MPSK modulation as a type of PSK modulation in which multiple carrier phases are used (col 8, lines 1-4). M-ary, or multiple phase modulation,

is advantageous because it produces improved error performance. It would be obvious to one skilled in the art to use an M-ary modulator and inverse M-ary modulator for a Phase Modulator and inverse Phase Modulator at the time of invention.

Claim 29, Neither Thorson, nor Horiguchi, nor Spruit disclose a binary phase shift keying (BPSK) modulator and inverse modulator. However, BPSK is a common type of phase modulation. In his digital modulation technique Underbrink discloses the use of BPSK modulation as a type of PSK modulation in which two carrier phases are used (col 7, lines 45-63). BPSK modulation is commonly used because of its simplicity and high tolerance to noise. It would be obvious to one skilled in the art to use BPSK modulation and inverse modulation for a Phase Modulation and inverse Modulation at the time of invention.

5. Claims 15 and 31 are rejected under U.S.C. 103(a) as being unpatentable over Thorson (U.S. Patent No. 6,101,225) in view of Horiguchi et al (U.S. Patent No. 6,133,791) and Spruit et al. (U.S. Patent No. 6,549,495) and in further view of Scott (U.S. Patent No. 5,784,403).

Claims 15, 31, Neither Thorson, nor Horiguchi, nor Spruit disclose a GMSK modulator and inverse modulator. However in his modulation device Scott teaches a phase modulator with an alternate embodiment that includes the use of GMSK modulation instead of PSK modulation (col 18, line 60). Because GMSK is a type of phase modulation and has the benefit of reducing the bandwidth required to modulate signals

if would be obvious to one skilled in the art to use the GMSK modulator and inverse modulator in Thorson's apparatus at the time of invention.

6. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Thorson (U.S. Patent No. 6,101,225) in view of Horiguchi et al (U.S. Patent No. 6,133,791) and Spruit et al. (U.S. Patent No. 6,549,495) as applied to claim 1 above, and further in view of Koslov et al. (U.S. Patent No.).

Claim 6, Neither Thorson, nor Horiguchi, nor Spruit disclose a configuration in which an intermediate filter coupled between the first mixer's output port and one of the second mixer's input ports. However, Koslov teaches a first mixer (fig 16, 602, col. 11, lines 1-4) controlled by a local oscillator (fig. 16, 608, col. 11, lines 8-11) connected to an filter (fig. 16, 604, col. 11, lines 1-4) coupled to a second mixer (fig. 16, 606, col. 11, lines 45-49) controlled by a local oscillator (fig. 16, 610, col. 11, lines 15-17). The use of a filter between the mixing units is advantageous because they reduce leakage that can occur from local oscillator inputs. Because of this it would be obvious to one skilled in the art at the time of invention to incorporate this means into Thorson's apparatus.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erin M. File whose telephone number is (571)272-6040. The examiner can normally be reached on M-F 10:00-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on (571) 272-3021. The fax phone

number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Erin M. File

EMF

8/3/2006

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MOHAMMED GHAYOUR
SUPERVISORY PATENT EXAMINER